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**Business, Society, Science and Technology[[1]](#footnote-1)**

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 I would first like to sketch before you the major global trends which would be affecting Pakistan in the future. This will provide the context in which the businesses have to make decisions. There are at least five broad trends which are highly relevant.

 First, the economic power balance is shifting from the U.S., Europe and Japan to Asian countries. The crises of 2007-08 did not fully debunk the myth of decoupling between the advanced and emerging economies as the spillover and contagion effects were quite destabilizing. The speed, intensity and spread of financial and then real economy crisis were too ferocious to spare any country of some consequence. But the resilience and the rapid recovery shown by the Asian countries, particularly the three most populous countries China, India and Indonesia, accounting for population of almost 3 billion, was simply remarkable. China resumed its growth trajectory and attained 8 to 9 percent growth rate. India is projecting growth rate around 6 to 7 percent and Indonesia slightly below these rates. 70% of world’s growth over the next few years would come from emerging economies with 40% from China and India. China has overtaken Germany as the world’s largest exporting nation and that too starting from almost a scratch thirty years ago. Asian markets and the expanding middle classes will be numerically much higher than the combined population of the U.S., Europe and Japan. This large consumer class will generate enormous demand for goods and services that has not been witnessed before. China has already surpassed the U.S. in the sales of autos while the number of potential customers is rising rapidly.

 This brings me to the second disturbing trend. Whether the natural resources – both renewable and non-renewable – required to meet the growing appetite of 3 billion consumers aspiring to reach the living standards of their fellow beings in the OECD countries would suffice for this purpose or not. Energy, water, food and mineral resources have so far been able to satisfy the growing world population and the prophets of doom and gloom have proved wrong. But, the world is becoming increasingly conscious of the risks posed to human lives and prosperity by climate change, environmental degradation and depletion of water resources. In the last decade, the scientific evidence has crystallized, the economic analysis of costs and benefits has become more convincing and broad based political consensus has emerged that something needs to be done to mitigate these risks and adapt to new realities. Therefore, the notions and measurements that have so far guided the businesses will become irrelevant and new measures that incorporate sustainability in the calculus will have to be developed and pursued.

 Third, a useful insight we gained from the global financial crisis was that the countries such as China, India, Pakistan, Bangladesh that pursued a path of cautious liberalization and exerted strong regulatory oversight and prudential norms on their financial institutions, did not permit exotic derivatives such as Collateral Debt Obligations and naked Credit Debt Swaps were left largely unscathed from the onslaught of the financial tsunami of 2008-09. Too much reliance on unfettered markets and the premise that markets are self correcting have brought a lot of grief to the western countries. Whether the OECD countries would revisit their regulatory mechanisms, re-examine their faith in efficient market hypothesis and learn from the experience of the Asian countries is something we do not know. It seems that we haven’t learnt very much from this crisis as hefty salaries and bonuses are once again hitting the headlines. We have to work hard together to make sure that the global financial system serves the needs of the real economy rather than have a self propelling path of its own.

 Fourth, there is a demographic transition which has already started but is going to intensify in the next four or five decades. Most of the European countries, Japan and the United States are going to have a higher proportion of aged population and a rising dependence ratio. China is going to enter that phase around the middle of the century. These countries will face labor shortages if they do not liberalize immigration rules and soften work permit requirements. The only region where the proportion of the younger population is actually rising and will continue to persist for a while is the South Asia region. The policy makers can take advantage of this opportunity if they equip their younger population with education and skill that will make them fit for serving in the labor deficient countries. Any negligence or inaction can turn the same demographic dividend into a disaster and social explosion.

Finally, the information explosion, the ease of access to internet, the increase in connectivity have created a situation where the sifting of right data to support business decisions, ascertaining the accuracy and reliability of the data and utilizing the relevant data for analysis and judgment calls has become an enormously complex task. According to the latest Economist magazine, 150 billion gigabytes of data was created in 2005. This year, it is estimated that the number will cross 1200 billion gigabyte. “Merely keeping up with this flood and storing the bits that might be useful, is difficult enough. Analyzing it, to spot patterns and extract useful information is harder still. Even so, the data deluge is already starting to transform business, government, science and everyday life.”

With the global trends staring at us, what should our businesses do to face these future challenges of the 12st century. I do not pretend that I have the perfect foresight or wisdom to spell out all the ingredients. The best I can do is to share with you some of the ideas and thoughts for further discussion, debate and deliberation.

 First, too much preoccupation with short term results – the quarterly, half yearly and annual results – has sacrificed the long term viability of many businesses. The demise of a number of well established companies such as Lehman Brothers, Arthur Andersen, Enron, during the past few years is a clear testimony of the pernicious effect of this short term approach. Greed and monetary benefits for the management and shareholders have been driving forces behind this approach. Investment in critical technology acquisition have been cut back and experienced talent have been fired in order to save costs. Little do they realize that this myopic outlook has weakened the capacity for efficient production in the future and impaired the competitive edge vis-à-vis others in the industry. Singular obsession with cost cutting is like harming the muscle in the process of reducing the fat in the body. Our business houses have to learn to distinguish critical investments for the future sustenance of the company from avoidable waste and unproductive expenses. Current consumption and investment are concepts that need to be grasped and pursued in the business sector as much as they are followed at the level of macro economy.

 Second, the exclusive emphasis on maximization of value for shareholders of the company has also proved to be hazardous. Our business executives will have to look at the prospects of maximizing the value of all stakeholders not only shareholders. Government, Suppliers, Employees, Customers, Communities, all have interest in the production and distribution of goods and services and the value addition. The convergence of these stakeholders interests with those of the shareholders is not always easy or straight forward. Trade-offs and tensions will have to be resolved, but this approach can create durable rather than transitory or peripheral benefits for the company. For example, sharing of value with the Government in form of taxes and duties, with the employees in form of fair wages and compensation, with the communities for supporting their social projects would win kudos for the company and ensure a smooth operating environment.

 Third, the concept of single bottom line, i.e. profit maximization has to give way to triple bottom line where financial and economic results are not the only indicator for measuring the performance of the company but the social impact and environmental impact are also given equal weight. Depleting non-renewable resources of a country at a rate that may produce large financial returns to the investors but leaves the society and the future generations worse off would no longer be considered as an acceptable performance measure. Similarly, if the company acts as an enclave of prosperity within a multitude of poverty, misery, illiteracy, disease and poor living conditions the results should not be taken as satisfactory. The recent trend of Corporate Social Responsibility that allocates a small fraction of profits to the community projects serves as a thin icing on the cake. The triple bottom line approach will involve some trade-offs in the short term but would prove to be a more robust and viable business model for an extended time horizon.

 Fourth, the recent crisis has also revealed that the businesses that are not anchored in strong ethical values or do not practice good corporate governance are at much higher risk than they themselves realize. ‘Walk the talk’ with all the right written scripts, verbose statements, pious intentions and ritualistic exhortations. It is only those Chief Executives who have practiced what they have preached, i.e. highest ethical standards and value-based management have come out ahead in this game. Those who were able to fend hundreds of million dollars as pay and perks or bonuses for themselves suddenly became object of ridicule and condemnation rather than admiration which they were used to. Enron had given rise to stringent laws and regulations with requirements of increase disclosure and oversight but the recent episodes have revealed the gap between the rhetoric and the reality. The Business Leaders have the responsibility to ensure that the company is observing and is in actual fact complying with the standards of corporate governance it has set for itself. Any violations should be reported to the CEO and if no action taken to the Board and still if no remedial action is taken, to the regulators.

 Fifth, it has become quite clear that the developing countries that have caught up with the advanced countries have relied upon technology accumulation as the driver of economic growth. Late comers that emphasized science and engineering stood the best chance of raising their per capita incomes. They laid down strong policies, set up robust institutions and provided adequate incentives which underpinned the foundations for national innovation capacity. These countries exploited their late arrival to tap into advanced technologies rather than replicating the entire preceding technological trajectory moving quickly from imitation to innovation. South Asian countries have to invest in innovation in order to sustain their economic performance rather than remain complacent with the existing technological frontier.

 If we examine these global trends and apply them to Pakistan as to how we are positioning ourselves either to take advantage or face these challenges, the outlook does not appear too promising.

 Most successful countries have benefitted from active participation in international trade as world exports have been growing twice as fast as world output. Our export share in the world market has not only slipped from 0.20 to 0.12 percent but the composition has remained largely unaltered for last several decades. The proportion of medium tech and high tech exports in our total export basket remains miniscule. Our neighboring countries have not only increased their market share but India is gradually diversifying from labor intensive resource based low end goods to engineering goods and other skill based exports. Cotton textiles continue to be the mainstay of our export base. We are far away from the dynamic sectors for which global demand is rising and are entrapped in stagnant sectors. Consumer preferences are shifting away from these sectors and very little technological innovation is taking place. Within textiles the man-made fibre and blends are taking ascendency over cotton-made clothing but we are still stuck in the traditional mode.

 As economies mature, people tend to spend less on goods and more on services. ICT and ICT-enabled services have become tradable across borders. Our neighboring country is a very good example where confluence of entrepreneurial prowess and foresight of businesses, investment in Science and Engineering education, neutral or leave it alone public policy and low wages has made them one of the largest service exporting nation in the world. India’s Service Trade / GDP ratio is 15 percent twice that of China which is only 7 percent. These exports are not limited to IT or Business Process Outsourcing (BPO) but also cover clinical research, pharmaceuticals, health care, automotive parts industry, financial services industry, etc. U.S. Food and Drug Administration (FDA) has its second largest presence after the U.S. in India because 110 FDA approved manufacturing facilities are carrying out contract work and research for large giants of the industry.

 200 multinational companies from all over the world have located their Research and Development (R&D) centers in India employing hundreds of thousands of quality scientists, biochemists, medical doctors, engineers and technicians. Increased job opportunities in R&D have created a positive feedback loop for promotion of higher education in Science and Technology related disciplines. Parents have begun to realize that these are the areas where jobs are abundant, remuneration is attractive, international mobility and employability are high. Every year 600,000 engineers are produced by the universities and engineering colleges – almost equal to the entire output of all our higher educational institutions in all disciplines (excluding Distance Learning Universities). Parents therefore encourage their kids to prepare for competitive tests to enter few prestigious institutions such as Indian Institutes of Technology (IITs). Five lakhs students appear at these tests but less than ten thousands get admitted to 17 IITs. But the unintended beneficial effect is that by preparing themselves for these rigorous tests, even those not admitted to IITs upgrade their knowledge and also imbibe an ethic of serious hard work and a mindset where they want to excel in their respective fields. The positive reinforcement created through this process has led to much greater emphasis on pursuit of Science and Technology related disciplines and a commitment to do well.

 In Pakistan, the fortunes have reversed. We had a much larger proportion of young students enrolled in Science subjects at our Higher educational institutes (HEIs) in 1960s compared to today. In 2010, out of 114,000 students who passed the Higher Secondary Certificate (HSC) exam in Karachi the single largest group of about 30 percent had taken Commerce compared to only 21 percent for pre-engineering. At Karachi University with an enrolment of about 25,000 the majority of the students are found in Commerce, Business, Management, Arts and Humanities, with a declining interest in Science subjects. You can realize the serious repercussions this tendency will have for our future economic growth. Yields in Punjab agriculture are lower than those across the border. Productivity in our textile industry is only 40 percent that of China. Our Service Sector has become a reservoir of underemployed work force. Our schools, universities and colleges are short of good teachers in Science and Maths. To meet these challenges we require high quality agriculture scientists, industrial engineers, IT specialists, biochemists, physicists in large numbers. But it is a pity that the supply of these professionals in shrinking. How can we compete with the rest of the world? How can we provide a better life for society? It is only through the diffusion and application of technology that we can achieve these goals. Access to higher education and re-orientation of demand towards Science, Technology, Engineering and Mathematics (STEM) can lead us towards that path.

 We have all types of Science and Technology (S&T) organizations in the country and some of them such as PCSIR have been in existence for over five decades. But their performance and contribution to the society and economy have been anything but stellar. They seem to have lost their innovative drive and inquisitive instincts and have become mired in complex, cumbersome bureaucratic procedures and processes to the neglect of the output. It is true that public sector outlay on R&D in Pakistan is only 0.25% of CDP but in my view even that is not being properly utilized and the outputs from these organizations have added very little value.

 To conclude, Pakistani Businesses will not be able to benefit from the vast opportunities that globalization has opened up unless they reorient their production structure towards medium tech and hi-tech exports of goods and services. This redirection cannot take place unless our Higher Educational Institutes (HEIs) produce quality scientific manpower. Our economic growth will sag and the society will lag behind other countries in absence of this reorientation of production structure and redirection of our human resource generation power.

1. Keynote address delivered at the International Conference on Business Management organized by the University of Management and Technology at Lahore on March 28, 2012. [↑](#footnote-ref-1)